

Leveraging SIUC's experimental pond facility to create a climate change research and education machine

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Abstract

Mitigating climate change is one of the most pressing issues of our time. Because the management of aquatic ecosystems can dictate whether they act as carbon sources or sinks, the high density of locally managed reservoirs in southern Illinois provides a unique opportunity to help mitigate climate change. However, more work is needed to identify which management decisions, particularly nutrient management decisions, maximize carbon sequestration in these systems. The experimental research ponds at Touch of Nature are one of SIU's best aquatic research and teaching tools, but they are currently only sporadically used in these pursuits. We propose to generate the background data necessary to use these ponds to their full potential to address climate change. At present, unquantified variation in pond nutrients and other biogeochemical parameters would confound research examining the effects of nutrient management on carbon sequestration. We propose to collect baseline biogeochemical data on one third (30) of these ponds for a year. This baseline data will advance climate change research by 1) adding important context to a masters project, 2) providing preliminary data for National Science Foundation grant proposals, and 3) facilitating interdisciplinary climate change research led by other SIU researchers. The data will also be integrated into an active learning module to enhance teaching outcomes for students in *Freshwater Invertebrates* (ZOOL 414). Ultimately, this project will cement SIU's role as a national and international leader in aquatic research and teaching and provide critical information about the role of freshwater ecosystems in global climate change.